mLEAM

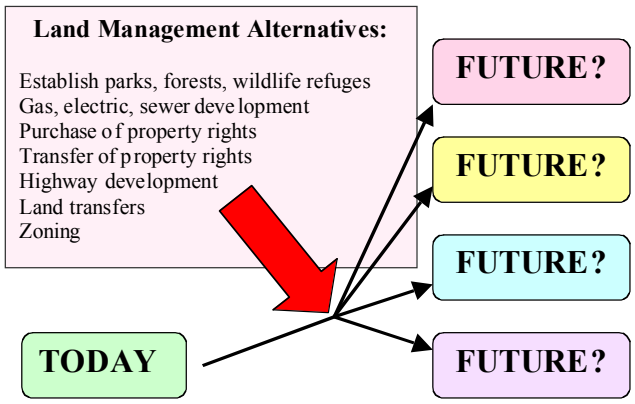
military Landuse Evolution and Impact Assessment Modeling

ERDC/CERL TN-01-2 rev. April 2005

mLEAM is a suite of software tools and application processes that help predict how current and proposed state, county, and local planning will affect future training and testing opportunities.

Future Training Opportunities

Installations embody enormous capital costs in infrastructure and personnel, and are critical resources for the sustainment of military readiness and projection capabilities. A current challenge to installation training sustainability is the continuous and rapid development of once rural land uses adjacent to our military assets.

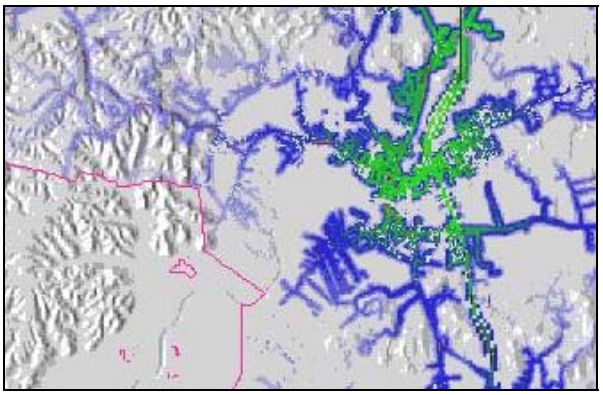


Projecting Future Land use Patterns With LEAM

Planners for the installations and the surrounding communities must make decisions—separately and jointly—that promote and maintain long-term training and testing opportunities. An important step in resolving some of these issues is to ensure that participants clearly understand the dynamic and spatial interactions between the military community's mission and land use needs, and the adjacent community's goals, planning policies, and probable spatial growth patterns.

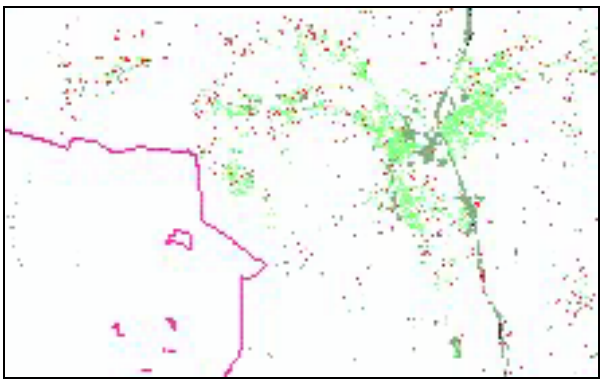
Identifying Attractiveness to Residential Development

LEAM's Residential Attractiveness Model, **LEAMram**, is a GIS-based analysis of current land use patterns to quickly and automatically identify where future residential development is likely to occur. (In the image below the corner of an installation is at the lower-left. Attractiveness increases from a blue through green.)



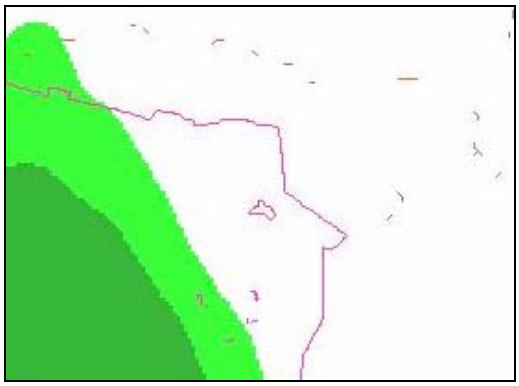
Predicting Future Urban Patterns

LEAM's Land Use Change model, **LEAMluc**, simulates the evolution of urban patterns in response to local, county, and state regional planning. Existing residential is green and LEAMluc projected growth is represented by red dots in the image below.



Predicting Loss of Training Opportunities

LEAM's training area suitability, **LEAMtas**, can be used to evaluate how the changing residential land use pattern might affect the suitable training lands. The probability of residential complaints in response to training and testing annoyances such as dust, smoke, and noise can be applied to current and projected residential patterns to create results like those below. The dark green area represents the area where a particular training could occur after predicted urban development with acceptable complaint levels. It is overlaid on the light green area, which is where the training could occur before the urban development.



Predicting Water Quality, Transportation Impacts, and Habitat Fragmentation

LEAMwater, LEAMtran, and LEAMfrag analyze projected urban patterns with respect to water quality, transportation network planning, and habitat fragmentation respectively. These tools provide quick predictions to allow comparison of alternative regional plans.

Regional Planning Charrettes

The mLEAM team conducts planning charrettes involving local stakeholders to generate and test alternative regional planning ideas.

User Inputs

mLEAM analyses can all be based on national data sets. Local planners may optionally supply better locally developed GIS data.

Benefits

With the mLEAM suite of software tools and analyses you can analyze current and proposed city, county, and state regional plans to understand the implications of those plans on your installation's future opportunities to support different training and testing missions. Regional planning decisions that can be tested include:

- Location of new highways
- Construction of new limited access highway ramps
- Major land purchases
- Purchase of development rights
- Construction of new roads
- Zoning plans
- Installation buffers.

mLEAM analysis results can be used to consider direct and indirect encroachment impacts of urban development patterns resulting from alternative regional planning decisions. Specifically they can address:

- Training and testing area capacity loss
- Regional water quality
- Habitat fragmentation and habitat loss.

The Future is Not Fixed! We encourage installation planners to work proactively with regional planning to help ensure that the planning investments and policies steer the region towards a future that is most conducive to accommodating future installation training and testing missions. This goes beyond simply predicting a future that we need to accept and "live with." Our tools and processes are best used with other capabilities to help create the best future by identifying the impacts of proposed planning ideas.

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